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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/914,170

12/05/2001

Ravishanker Krishnamoorthy

851663.431USPC

1979

7590

05/14/2004

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EXAMINER

TZENG, FRED

ART UNIT

PAPER NUMBER

2651

DATE MAILED: 05/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/914,170

Applicant(s)

KRISHNAMOORTHY ET AL.

Examiner

Fred Tzeng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 December 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 8-10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-10 are presented for examination.

#### ***Drawings***

2. This application lacks formal drawings. The informal drawings filed in this application are acceptable for examination purposes. When the application is allowed, applicant will be required to submit new formal drawings.
3. New corrected formal drawings are required in this application because figures 1, 3, 4 containing handwriting numerical labels such as 16, 18, 10 and 22, etc., which are inconsistent with the computer generated drawings. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

#### ***Specification***

4. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.
5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract

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on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

7. Claim 1 is objected to because of the following informalities: claim language does not clearly specify which motor is being connected or disconnected by the driving circuit. Is the first motor being connected or the second motor being connected, or vice versa? Appropriate correction is required.

8. Claim 4 is objected to because of the following informalities: Claim 4 recites the limitation "...the upper and lower supply rails..." in lines 26-27 on page 11. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

9. Claim 8 is objected to because of the following informalities: a claim limitation is missing between **upper** and **and wherein**. Appropriate correction is required.

10. Claim 8 is objected to because of the following informalities: Claim 8 recites the limitation "...the upper supply rail..." in line 2 on page 13. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

11. Regarding claims 2, 7, 8, 9 and 10, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Wevers et al (USPN 4,679,102), hereafter as Wevers.

Regarding claim 1, Wevers discloses a method for controlling a motorized mechanism in the event of external power loss (see column 1 lines 7-13), the motorized mechanism comprising first and second motors coupled to a common driving circuit (see column 3 lines 23-31 and figure 1A; i.e., the first spindle motor 27 and the second stepper motor 30 coupled to a common driving circuit microprocessor 40), the first

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motor being arranged to rotate at a substantially constant rate with external electrical power applied to the driving circuit (see column 3 lines 29-31 and figure 1A), wherein in the event of loss of the external electrical power to the driving circuit, the driving circuit is controlled so as to connect and disconnect the first and second motors to the driving circuit in substantially out-of-phase synchronism to enable the second motor to be driven with electrical power derived from back-emf of the rotating first motor (see column 1 lines 65-68, column 2 lines 1-26 and column 3 lines 10-53; i.e., the derived spindle motor back EMF power source 54 of the first spindle motor 27 is connected while the second normal stepper motor 30 control circuitry being disconnected to power the stepper retract circuit for driving or retracting the head 10 to the nondata area).

Regarding claim 2, Wevers discloses that the motorized mechanism comprises a driving mechanism for a disk drive (see column 3 lines 23-31 and figure 1A; i.e., the microprocessor 40 and circuitry 42, 44 and 46), wherein the first motor is a spindle motor and the second motor is a read/write head positioning motor (see column 3 lines 10-22 and figure 1A; i.e., the spindle motor 27 and the read/write head positioning stepper motor 30).

Regarding claim 3, Wevers discloses that in a disk drive having a spindle motor for rotating a data storage disk and a head positioning motor for positioning a read/write head (see column 3 lines 4-31; i.e., the spindle motor 27 for rotating discs 12 and stepper motor 30 for positioning read/write head 10), the spindle motor and positioning motor being coupled to be driven from an external power source by way of a driving circuit (see column 3 lines 23-31), a method for controlling the motors in the event of loss

of the external power source during rotation of the spindle motor wherein the spindle motor and positioning motor are switched on and off from the driving circuit substantially in out-of-phase synchronism to enable the positioning motor to be driven with electrical power derived from back-emf of the rotating spindle motor (see column 1 lines 65-68, column 2 lines 1-26 and column 3 lines 10-53; i.e., the derived spindle motor back EMF power source 54 of the first spindle motor 27 is connected while the second normal stepper motor 30 control circuitry being disconnected to power the stepper retract circuit for driving or retracting the head 10 to the nondata area).

Regarding claim 4, Wevers discloses that the spindle motor is coupled to the upper and lower supply rails of the driving circuit by way of a plurality of respective upper and lower semiconductor switching elements having parallel diode elements, and wherein switching on of the spindle motor corresponds to switching of the lower switching elements allows back-emf derived from the spindle motor to generate a recirculating current through the upper switching elements to the upper supply rail (see figure 2 and column 3 lines 48-68 and column 4 lines 1-5; i.e., the spindle motor is coupled to the upper supply rail 62 and lower supply rail 64 by way of a plurality of respective upper and lower semiconductor switching elements having parallel diode elements and wherein switching on of the spindle motor 27 corresponds to switching of the lower back-EMF winding 64 switching elements allows back-EMF derived from the spindle motor 27 to generate a rectified and filtered recirculating current through the upper switching elements to the upper supply rail 62).

Regarding claim 5, Wevers discloses that the positioning motor is coupled to the upper and lower supply rails of the driving circuit by pairs of upper and lower semiconductor switching elements, and wherein switching on of the positioning motor corresponds to switching on a selected one of the pairs of switching elements to connect the positioning motor to the upper and lower supply rails to drive the positioning motor with the recirculating current (see column 3 lines 59-68, column 4 lines 1-28 and figure 2 and the explanation rationale for claim 4).

Regarding claim 6, Wevers discloses a method for controlling a disk drive having a spindle motor and a positioning motor both coupled to a driving circuit (see column 3 lines 10-31), comprising the steps of: detecting a loss of supply power to the deriving circuit (see column 3 line 32); chopping connection between the spindle motor and the driving circuit to generate an intermittent back-emf derived recirculating current (see column 3 lines 42-45); and chopping connection between the position motor and driving circuit at least substantially synchronized out-of-phase with the chopping of the spindle motor connection to enable driving of the positioning motor using the recirculating current (see column 3 lines 35-38, 42-53).

Regarding claim 7, Wevers discloses a disk drive having a spindle motor for rotatably driving a spindle and/or disk (see column 3 lines 4-6), a positioning motor for positioning a read and/or write head (see column 3 lines 15-22), and a motor driving circuit coupled to controllably drive the spindle motor and positioning motor under normal operation using an external power supply (see column 3 lines 23-31 or figure 1A; i.e., items 40, 42, 44 and 46), the motor driving circuit including a controller (see figure



1A; i.e., the items 40, 46, 44 and 54) adapted to respond to loss of external power supply by chopping connection between the driving circuit and the spindle and positioning motors respectfully in a substantially synchronized out-of-phase manner to enable driving of the positioning motor with a recirculation current derived from a back-emf of the spindle motor (see column 3 lines 23-53).

***Allowable Subject Matter***

14. Claims 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: Claims 8-10 are allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a disk drive comprising a driving circuit for driving its spindle motor and stepper motor respectively, wherein the driving circuit including a storage capacitor for enabling transfer of BEMF energy from the spindle motor to the storage capacitor for powering VCM, and a voltage clamp for limiting the boosted storage capacitor voltage to protect other circuits from being damaged by a high voltage.

***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

17. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 308-9051, (formal communications, please mark

"EXPEDITED PROCEDURE")

Or:

(703) 308-6606 (for informal or draft communications, please label

"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021

Crystal Drive, Arlington. V.A., Sixth Floor (receptionist).

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Tzeng whose telephone number is 703-305-4841.

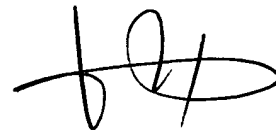
The examiner can normally be reached on weekdays from 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 703-308-4825. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-746-5710 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

A handwritten signature in black ink, appearing to be 'Fred F. Tzeng', with a stylized, cursive script.

Fred F. Tzeng

May 11, 2004